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| 10/575,163      | 04/10/2006  | Thierry Georges      | 0501-1157           | 6822             |

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|-------------------|--|
| EXAMINER          |  |
| CARTER, MICHAEL W |  |

|          |              |
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| ART UNIT | PAPER NUMBER |
| 2809     |              |

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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

## Office Action Summary

Application No.

10/575,163

Applicant(s)

GEORGES, THIERRY

Examiner

Michael Carter

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 10 April 2006.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1-16 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-10 and 12-16 is/are rejected.
- 7) ☒ Claim(s) 11 is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 10 April 2006 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
  - ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO/SB/08)  
Paper No(s)/Mail Date 7/11/2006
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_\_
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: \_\_\_\_\_

## DETAILED ACTION

### ***Claim Rejections - 35 USC § 112***

1. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

2. Claim 12 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

3. Regarding claim 12, the phrase "for example" renders the claim indefinite because it is unclear whether the limitation following the phrase is part of the claimed invention. See MPEP § 2173.05(d).

### ***Claim Rejections - 35 USC § 102***

4. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

5. **Claim 13** is rejected under 35 U.S.C. 102(b) as being anticipated by Mooradian, US Patent 5,365,539 (hereinafter referred to as Mooradian).

6. For claim 13, Mooradian teaches the method characterized in that the optical path length covered by the laser beam is varied by translating the laser beam emitted by the pumping means with respect to the input face of the amplifier (column 4, lines 38-40).

***Claim Rejections - 35 USC § 103***

7. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

8. **Claims 1, 5-10, and 12** are rejected under 35 U.S.C. 103(a) as being unpatentable over Shichijyo et al. US patent 5,809,048 (hereinafter referred to as Shichijyo) in view of Nettleton et al. US Patent 6,373,865 (hereinafter referred to as Nettleton), and further in view of Dixon et al. US Patent 4,884,276 (hereinafter referred to as Dixon).

9. For claim 1, Shichijyo teaches, an optical pumping means (figure 3, label 30 and column 14, lines 63-65), an amplifying medium (figure 13, label 61 and column 14, lines 63-65) excited by a laser beam with a fundamental wavelength emitted by the optical pumping means, and a birefringent crystal for frequency doubling (column 15, lines 5-6, and figure 13, label 62); characterized in that it also comprises an isotropic medium inserted between the output face of the amplifying medium and the input face of the birefringent crystal (figure 13, space between 61 and 62),

Shichijyo does not teach the output face of this amplifying medium being cut according to the Brewster angle for said fundamental wavelength, and the amplifying medium and the birefringent crystal being firmly attached to each other so as to constitute a monolithic resonant cavity, and that the crystalline axis "c" of the

birefringent crystal forms an angle  $\theta_c$  which is not zero with respect to the orthogonal direction of the polarization of the fundamental wave, defined by the Brewster surface.

However, Nettleton teaches the output face of this amplifying medium being cut according to the Brewster angle for said fundamental wavelength in order to make the laser operate in a linearly polarized parallel mode (figure 2, label 21b and column 2 lines 46-50), and the amplifying medium and a crystal being firmly attached to each other so as to constitute a monolithic resonant cavity (figure 5) in order to provide smaller devices and require less alignment (column 1, lines 18-21).

It would have been obvious to one of ordinary skill in the art, at the time the invention was made, to combine the second harmonic generator of Shichijyo with the Brewster cut and monolithic cavity of Nettleton in order to make the laser operate in a linearly polarized mode, and provide smaller devices requiring less alignment.

The previous combination does not teach the crystallographic c-axis is matched with the polarization of the incident radiation.

In the same field of endeavor, Dixon teaches the crystallographic c-axis is matched with the polarization of the incident radiation, which in this case is the parallel polarization due to the Brewster cut, in order to produce Blue light (column 9, lines 18-28)

It would have been obvious to one of ordinary skill in the art, at the time the invention was made to choose an angle  $\theta_c$  which is not zero with respect to the orthogonal direction of the polarization of the fundamental wave in order to produce blue light.

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10. For claim 5, Dixon teaches the combination in claim 1 characterized in that the plane orthogonal to the direction of propagation of the fundamental wave contains the crystalline axis "c", this plane forming an angle with respect to the "a" and "b" axes of the birefringent crystal so as to obtain a phase matching at the operating temperature between the fundamental wave and the harmonic wave (column 9, lines 18-24).

11. For claim 6, Shichijyo teaches the amplifying medium is constituted by yttrium aluminum garnet doped with neodymium (abstract).

12. For claim 7, Nettleton teaches the amplifying medium is a cylindrical Nd: YAG (figure 5) the input face of which constitutes a plane mirror (column 3, lines 6-9).

13. For claim 8, Shichijyo teaches the pumping means is a laser diode (abstract).

14. For claim 9, Shichijyo teaches the birefringent crystal is made from potassium niobate ( $\text{KNbO}_3$ ) (abstract).

15. For claim 10, Shichijyo teaches the isotropic medium is the air (figure 13, space between 61 and 62).

16. For claim 12, Nettleton teaches the isotropic medium is constituted by an isotropic crystal the refractive index of which is close to, for example within 10% of, the refractive index of the birefringent crystal (figure 2, label 22).

17. **Claims 2-4, and 14-16** are rejected under 35 U.S.C. 103(a) as being unpatentable over Shichijyo in view of Nettleton, and Dixon as applied to claim 1 above, and further in view of Bacher et al. US Patent 7,065,109 (hereinafter referred to as Bacher).

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18. For claims 2-4, the above combination does not teach the input face and output face are cut according to a slight angle  $\epsilon$  and  $\epsilon$  is less than or equal to one degree.

In the same field of endeavor, however, Bacher does teach cutting the faces at a small angle  $\epsilon$  which is less than or equal to one degree (column 13, lines 36-39) in order to prevent unwanted etalon effects (column 12, lines 48-52)

It would have been obvious to one of ordinary skill in the art, at the time the invention was made, to combine the combination of claim 1 with Bacher's angled faces in order to prevent unwanted etalon effects.

#### ***Allowable Subject Matter***

19. Claim 11 is objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

#### ***Conclusion***

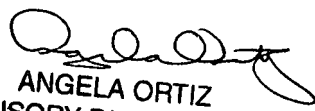
Any inquiry concerning this communication or earlier communications from the examiner should be directed to Michael Carter whose telephone number is (571) 270-1872. The examiner can normally be reached on Monday-Friday, 7:00 a.m.-4:30 p.m., EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Angela Ortiz can be reached on (571) 272-1206. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

MC

  
ANGELA ORTIZ  
SUPERVISORY PATENT EXAMINER

8/5/02